

Knowledge Processes in German Hospitals

First Findings from the Network for Health Services Research Metropolitan Region Bremen-Oldenburg

Lars Rölker-Denker, Insa Seeger, Andreas Hein

Department of Health Services Research
University of Oldenburg
Oldenburg, Germany
lars.roelker-denker@uni-oldenburg.de
insa.seeger@uni-oldenburg.de
andreas.hein@uni-oldenburg.de

Abstract—This paper summarises the work on organisational and network learning process among hospitals in Germany. It is a descriptive analysis of learning processes identified by interviews with board of directors and observations in clinical wards. A shift from organisational learning to inter-organisational/network learning could be confirmed. This paper mentions some of them and gives an outlook on further work.

Keywords-health services research; organisational learning; inter-organisational learning; hospitals; Germany.

I. INTRODUCTION

The increase of knowledge and information is a general phenomenon and thus also applies to healthcare. Emerging cooperation between health care organisations (HCO) and in addition, Mergers & Acquisitions by highly integrated health care groups extends the organisational knowledge base even more and results in inter-organisational cooperation. In addition, medical schools and medical university hospitals represent key actors in medical knowledge development [1].

Organisational learning routines are key factors for learning HCO like hospitals in general [2] and clinical wards [3] but also for larger network structures [4]. This paper will present some newly identified organisational and inter-organisational learning routines from field studies in two running projects in German hospitals.

In section 2, both projects, the methodology and data assessment are briefly introduced. Section 3 contains the results so far, separated into organisational and inter-organisational/network level. Section 4 discusses the weaknesses of the approach and the comparison with the state of the art, especially Lipshitz/Popper [3]. The paper closes with conclusion and outlook in Section 5.

II. METHODOLOGY AND DATA ASSESSMENT

The project “Network on Health Services Research in the Metropolitan Region Bremen-Oldenburg” started on January 1st 2014 with duration of 2 years [5]. A framework for semi-structured interviews has been developed on several health

related topics like cooperation, gaps in healthcare provision and knowledge processes. The knowledge process related questions are:

- *Organisational level*: Are learning routines established between the clinical wards?
- *Inter-organisational/network level*: Do these learning routines exist between the hospital and other health care organisations like family doctors, rehabilitation centres and other?
- What is the role of information and communication technology for these learning processes?
- What is the role of learning processes for patient care?

Due to the design of the project, which has as a strategic task the initiation of a (research) network, it was decided to conduct interviews instead of performing a survey. For networking reasons it was important to get in personal contact with the board of directors. In addition, the researcher aimed at raising the answering rate by personal contact. Between April and October 2014 data from 22 hospitals have been gathered, by only having 3 hospitals with negative feedback not willing to take part in the study. Interviewed persons have been from the board of directors, mostly chief executives and medical directors, sometimes with the nursing director.

In addition, there are observations and interviews in context of a doctoral study. Three HCOs (two hospitals and one rehabilitation centre) are analysed by 1-2 day-observation of clinical daily routine, supplemented by interviews with personnel from the observed wards. Up to now, seven wards have been observed and four interviews have been conducted. Additional information on methodology and results on the doctoral study can be found at [6] and [7].

III. RESULTS

In this section the identified learning processes are listed and, if applicable further literature is indicated. They are distinguished between organisational and inter-organisational level. Learning processes on the

organisational level only refer to processes inside of the health care organisations. Inter-organisational learning processes occur when at least one professional health actor from outside the health care organisation is involved.

A. Organisational level

The following learning processes have been identified on the organisational level:

- *Morning/lunch conferences*: these interdisciplinary conferences take place one or more times a week and bring together physicians from the general disciplines of internal medicine or surgery. These conferences are across clinical wards, e.g., in the internal medicine conference physicians from all sub-disciplines like cardiology, geriatrics, nephrology and others meet and discuss interdisciplinary or organisational issues. Sometimes these meetings are enriched by small presentations on a specific medical problem [7].
- *ELearning applications*: eLearning applications from different sources with focus on physicians (CME – continuous medical education) or nursing are also part of the organisational level domain inside a hospital (e.g., for Germany see [8]).
- *Conventions/closed-door meetings*: these kinds of meetings also occur in hospitals in different manifestations. One complete ward (e.g., the cardiological ward) or one professional group (e.g., all surgeons' assistants) come together for one or two-day meeting abroad and discuss strategic issues for the future and review the past period. This meeting can also be used in integrated healthcare groups (inter-organisational/network level), e.g., all geriatric physicians of all hospitals from one healthcare group meet once a year.
- *Interdisciplinary case conferences/clinical conferences*: these conferences are organised e.g., once a week and difficult cases are discussed in an interdisciplinary matter [7]. They can be distinguished between internal medicine and surgery, but also conferences between these general disciplines are possible. The typical process starts with a physician having a difficult case and signs up the patient to the clinical conference. During the conference the patient's case is discussed involving all necessary data and information (x-ray, laboratory results, etc.) and in the end, a recommendation is given to the enquiring physicians.
- *Radiological conference*: Clinical radiological conferences are a modification of the interdisciplinary case conference. During this conference the radiological ward demonstrates the recent imaging (x-ray, x-ray computed tomography, magnetic resonance imaging) and discusses the results with the clinical wards, e.g., with the neurosurgical ward on neoplasms located in the brain and how to proceed.

- *Interdisciplinary therapeutically pathways/clinical pathways*: These pathways are derived from medical guidelines (developed by medical societies) and adapted to the unique clinical context of a hospital. The adaption and introduction process is performed by interdisciplinary team of physicians and nurses; afterwards an interdisciplinary monitoring team controls the execution and initiates slight adjustments [9].
- *M&M conference (mortality and morbidity conference)*: these meetings aim on retrospective analysis of patient's data. The focus can be on medical errors, as well as on the teaching value [3] [10].
- *Idea management*: Established idea management processes are also implemented in healthcare organisations like hospitals. As in other branches they are an important factor for organisational improvements.
- *Critical Incident Reporting Systems (CIRS)*: CIRS are used for reporting critical (nonlethal) incidents in an anonymous manner. The anonymous way of reporting is intended to raise the rate of reporting incidents and protecting the reporting person [11].
- *Surgical operation reflection meetings*: these meetings aim on interaction and reflection between physicians (surgeons, anaesthetist) and other personnel involved in surgical operations like surgical nurses or surgeon's assistants [3].

B. Inter-organisational/network level

The following learning processes have been identified on the inter-organisational/network level:

- *Conventions/closed-door meetings*: similar to conventions/closed-door meetings on organisational level (see Section III.A.).
- *Tumour conferences/tumour boards*: Tumour boards refer to oncological diseases and cancer and are often carried out as interdisciplinary meetings. They connect clinical oncologists with residential physicians (family doctors and oncologists) in order to improve the compliance of the patient and guarantee ongoing care after hospital treatment [12]. In rural areas with a low physician and/or population density, these meetings can be carried as remote meetings supported by tele- or videoconferences and/or electronic medical records [13].
- *Rehabilitation conferences*: these conferences are similar to tumour boards but focus on rehabilitation. In Germany, clinical care/hospitals and rehabilitation are separated into two different sectors. For example, clinical geriatricians and rehabilitation geriatricians, in some cases complement by residential physicians, meet one a regular basis and discuss patients moving from the clinical sector to the rehabilitation sector.
- *Diseases-related regional networks*: many healthcare organisations are active in disease-related networks, often with a regional focus. These

networks differ from hospital networks, mixed hospital-family physician networks and networks of family physicians.

- *Advanced education with network organisations*: usually the hospitals offer their advanced education programme to their employees exclusively. In this case, selected parts of the programme are also offered to resident physicians, e.g., regular radiological trainings for clinical and resident radiologists or nursing trainings for multiple hospitals.
- *Tele-diagnosis*: tele-diagnosis is a tele-medical application and refers to remote diagnosis. This is often used in rural areas or areas with low density of medical specialist or hospitals [14].
- *Common Quality management with network partners*: quality management (QM) is an established process in hospitals for many years. These QM systems can also be expanded to network partners like ambulatory health centres connected to a hospital.
- *Common ward conferences*: in integrated healthcare groups regular ward conferences can be expanded to all group hospitals, possibly scaled by regional or other parameters, e.g., a group-wide conference of all neurological wards.
- *Common leadership of clinical wards among several hospitals*: in integrated healthcare groups several hospitals may have one head physician for e.g., all geriatric wards.
- *Network CIRS*: hospital-wide CIRS (see III.A) can be expanded to all hospitals of one healthcare group or to other connected organisations like ambulatory health centres.

IV. DISCUSSION

A. Comparison with state of the art

Lipshitz and Popper [3] have identified eleven organisational learning processes in hospital environments (they call them organisational learning mechanisms) in their early work. Table I gives an overview on the processes identified by Lipshitz/Popper and the processes verified during the interviews, including the frequency of occurrence. The occurrence is wrapped up by the participating hospitals and not by the individual interviewees.

In addition, the following organisational learning routines have been identified during the interviews:

- *Interdisciplinary case conferences/clinical conferences*: one hospital, also validated by interviews in two clinical wards.
- *Interdisciplinary therapeutically pathways/clinical pathways*: one hospital also validated by interviews in one clinical ward.
- *Radiological conference*: two hospitals, also validated by observations in three surgical wards.
- *Idea management*: one hospital.

The organisational learning processes on an inter-organisational level had not been focussed by Lipshitz/Popper in the past. In particular, the inter-organisational processes identified by interviews are listed in Table II.

All other inter-organisational learning processes have been only mentioned once, this applies to:

- Conventions/closed-door meetings
- Rehabilitation conferences
- Advanced education with network organisations
- Tele diagnosis
- Common Quality management with network partners
- Common ward conferences
- Common leadership of clinical wards among several hospitals
- Network CIRS

Li et. al. [19] performed a systematic review on communities of practice and also identified learning processes on an organisational and inter-organisational level. In particular these are fostered interaction between students and expert physicians, informal learning clubs (both on an organisational level), health care agency collaboration, and virtual communities over organisational borders (both on an inter-organisational level). All these processes have been identified by the interviews.

B. Weaknesses/Gaps

The interviews focussed on the board of directors. This implies some weaknesses:

- The medical directors are from discipline, either one surgical oriented or one internal medicine discipline. This mind-set has an influence on the discussion results, e.g., a surgeon will more focus on surgical reflection meetings. Interdisciplinary process should be focussed by both disciplines.
- There might be more learning processes in the distinct wards not being visible to the medical directors in their role as a board member, e.g., there are some specific geriatric processes like the multi-professional geriatric team session [7]. For a complete overview, the interviews have to be conducted with at least all chief physicians of the relevant wards. Since the project focusses on a first overview this approach is acceptable.
- There might be also learning processes in the distinct wards which are not visible to the board members in their role as managers in their wards. This can be coped with observations in the wards which are an approach in the associated doctoral studies [7]. In addition, there are some learning processes being naturally covered by the daily work in the wards, e.g., daily physician rounds, and, due to this, not being mentioned by the board of directors.

TABLE I. OCCURRENCE OF ORGANISATIONAL LEARNING PROCESSES

Organisational Learning Process	Frequency of occurrence/remarks
Physicians' rounds	Naturally covered by daily work, validated in all wards by observations
Staff meetings	Naturally covered by daily work, validated in all wards by observations
Reviews of medical records	Naturally covered by daily work, validated in all wards by observations
Nursing staff meetings	3 hospitals
Journal club	2 hospitals, also validated in all wards by interviews and observations
Morbidity-mortality conferences	1 hospital
Reflections in and after surgery	1 hospital
Periodic reviews	Not mentioned
Research reports	Not mentioned
Clinical pathological conferences	Not mentioned
Video demonstrations	Not mentioned

TABLE II. OCCURRENCE OF INTER-ORGANISATIONAL LEARNING PROCESSES

Inter-organisational Learning Process	Frequency of occurrence/remarks
Tumor conferences/tumor boards	5 hospitals, also validated by interviews in two clinical wards
Diseases-related regional networks	3 hospitals (adiposity, trauma, tumour surgery)
Common head physicians rounds of clinical wards among several hospitals	2 hospitals

- Both approaches (interviews with chief physicians and observations) have a bigger demand on time and personnel resources than semi-structured interviews with the board of directors. For practical reasons a good balance between resources available and study objects to analyse needs to be defined. In the associated doctoral studies the observations and interviews with chief physicians are focussed on two hospitals and one rehabilitation centre and, since the studies have a focus on geriatrics, on the geriatric wards and the wards with the most important patient movements.

V. CONCLUSION/OUTLOOK

A. Conclusion

Organisational learning in healthcare has evolved from an intra-organisational phenomenon to an inter-organisational/network phenomenon in Germany. This is similar to developments in other countries. For instance, since the mid of the 1990s cancer networks have been emerging and fostering the inter-organisational exchange between involved physicians [15].

Another reason for emerging inter-organisational learning processes is enhanced cooperation between hospitals for economic reasons; on one hand more cooperation between hospitals on a regional level, on the other hand more integrated healthcare groups (e.g., Helios or Asklepios in Germany). In these settings, intra-organisational learning processes have been adapted to the new network environment, e.g., CIRS originally used in distinct hospital settings and now used in healthcare groups.

B. Outlook

The interviews in the project Network on Health Services Research in the Metropolitan Region Bremen-Oldenburg will be continued, same applies to the work in context of the doctoral studies.

Next step is the modelling of selected learning processes with a combined approach of 3LGM² (Three-Layer Graph-based Meta Model; developed for clinical IT architectures and hospital functions modelling [16]) and KMDL[®] (Knowledge Modelling and Description Language [17]; based on the knowledge conversion of Nonaka & Takeuchi [18]) which has already started [7]. Based on these future findings the velocity of knowledge dissemination will be measured and, if necessary, process remodelling proposals will be suggested. A best-practice transfer is also planned among the participating hospitals.

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